

# Kingfisher Young Knowledge Guide for Teachers

Our youngest students—kindergarteners and first, second, and third graders—are probably the most visual generation we've had in our classrooms. Movies, television, magazines, and of course computers have brought the world to them in pictures. And the Kingfisher Young Knowledge series capitalizes on their ability to take in images and learn from them. In your early-childhood classroom, these books will serve as basic science learning and teaching tools, covering subjects in which children have a natural interest—perennially popular topics given completely modern presentations.

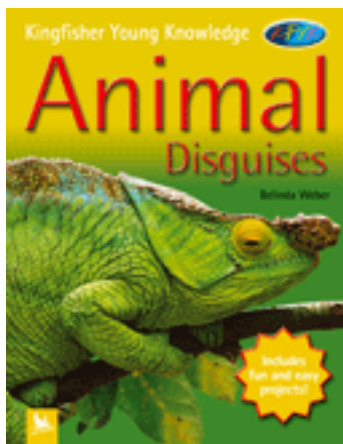
The vocabulary words introduced, both those highlighted at the bottom of many of the pages and those defined in context, will enable your students to talk about the subjects they are learning with precision. The projects in the books, presented with step-by-step instructions, offer hands-on learning experiences for individual students, groups, or the whole class. Or they might be used for take-home projects children can share with their parents.

The books also give your students experience with nonfiction reading in the content areas. With their thorough indexes, they also serve as ready reference sources to lead children to answer questions that naturally arise in the classroom. A rock sample brought in for show-and-tell is further explained in *Rocks and Fossils*. A story about finding a bird's nest will be better understood with reference to both *Animal Homes* and *Birds*. And a science fiction movie will make some real-life sense after students look through *Robots*.

This guide is designed to be used with the individual books or with the KFYK series as a whole.

## Kingfisher Young Knowledge

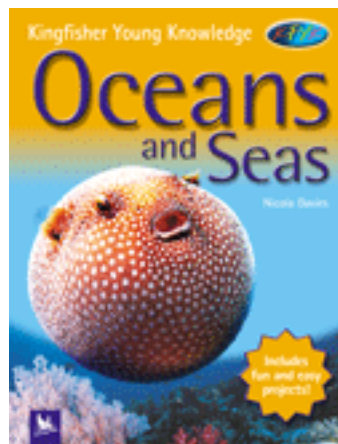
---



### **Animal Disguises**

by [Belinda Weber](#)

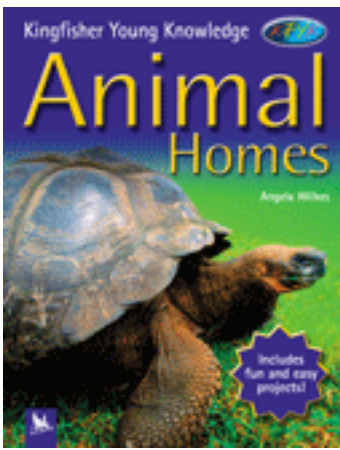
**New!** [Teacher's Guide](#)



### **Oceans and Seas**

by [Nicola Davies](#)

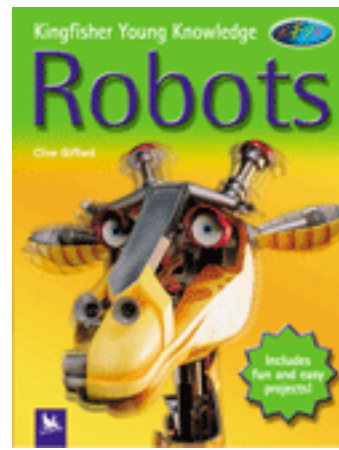
[Teacher's Guide](#)



## Animal Homes

by Angela Wilkes

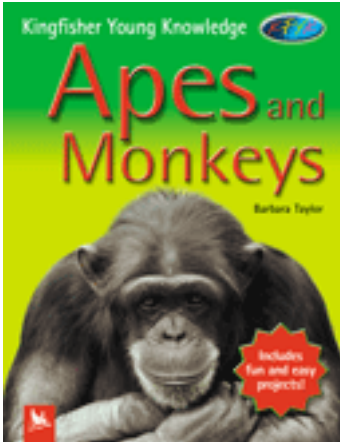
Teacher's Guide



## Robots

by Clive Gifford

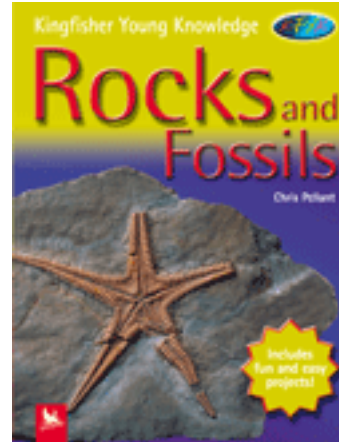
Teacher's Guide



## Apes and Monkeys

by Barbara Taylor

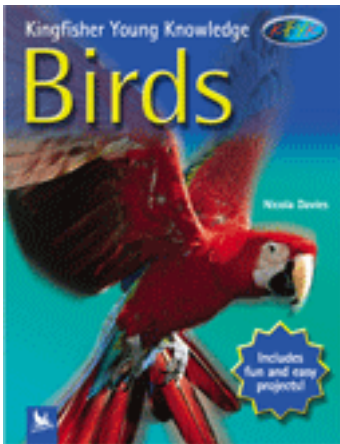
**New!** Teacher's Guide



## Rocks and Fossils

by Chris Pellant

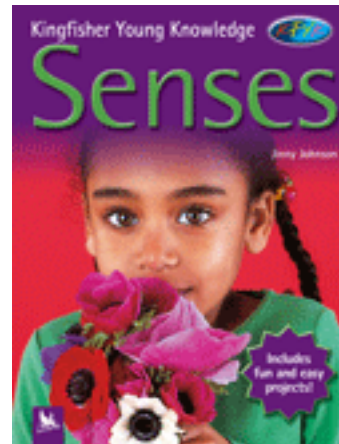
Teacher's Guide



## Birds

by Nicola Davies

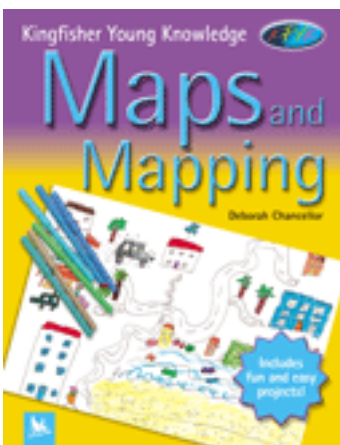
Teacher's Guide



## Senses

by Jinny Johnson

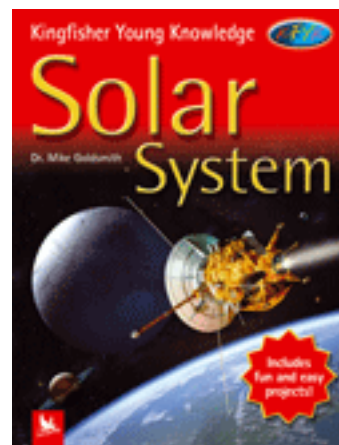
**New!** Teacher's Guide



## Maps and Mapping

by Deborah Chancellor

**New!** Teacher's Guide



## Solar System

by Dr. Mike Goldsmith

**New!** Teacher's Guide

# Kingfisher Young Knowledge Books in Your Classroom

---

## Introducing Science to Your Students

Teaching science in the early elementary grades is a combination of introducing very particular vocabulary and helping students build a foundation for looking at the world and being able to talk about it. It is stimulating their curiosity, encouraging their questions, and supporting their search for answers through observation, projects, and research.

Each guide to a Kingfisher Young Knowledge book begins with a discussion and the creation of a KWL chart. Through the discussion, children will recognize that they already know a lot about science. By creating the chart, they will guide the class's study of the subject.

## Vocabulary

Each book's learning guide features a vocabulary-building section. The words the children learn should be mastered with each book and then combined into a growing general science classroom dictionary, so that your students will get a sense of how much they are learning every day.

For each book, we suggest creating a word wall based on the new words introduced at the bottom of many of the pages. The word wall should also contain science words and unfamiliar general vocabulary words that students discover within the text.

The words from the word wall should also be added to a classroom science word box. New words should be written on 3 x 5 index cards. The definition of the word should be written on the back of the card. The cards should be entered alphabetically in the vocabulary box. Students should be encouraged to bring in other words or phrases they gather from their own experiences.

## Creating a Science Corner

Make a place for scientific discoveries in your classroom. Create a sign—SCIENCE LIVES—and place it on a table in a corner. Ask children to bring in discoveries—a bird's nest, a fossil, a photograph or drawing, or something else they've seen. They should complete the ["My Discovery" form](#) for each object they add to the class's science collection.

## Parent Involvement

Each Kingfisher Young Knowledge Book offers several activities that are easy to adapt to take-home projects, inviting parents and children to work together to enhance classroom studies at home.

We have developed a [letter to parents](#) that you can use to inform your students' parents and caregivers about what the class is studying in science. It also welcomes parents who have special knowledge of a field or who work in a field to visit the class and talk about what they do.

We encourage you to allow your students to take the Kingfisher Young Knowledge Books home. Place each book in a one-gallon zipper-lock plastic bag, punch a hole in each bag, and hang the books on hooks in your science corner. Place a card in the bag with the title

of that book printed on it. Have the child sign the card when he or she takes a book home, so you can keep track of where the books are. When the student returns the book, be sure to ask if he or she did any of the activities at home.

[THIS IS A REPRODUCIBLE. Copy onto your school letterhead]

Dear Parents:

As part of our class's studies in science, we will be using the Kingfisher Young Knowledge books-a series of very visual presentations in a variety of scientific areas. Through reading, lessons, and activities, your children will be learning about such subjects as animal homes, the oceans, rocks and fossils, robots, and more.

It is my hope that your children will become more observant of the world around them - and more curious about it. Please encourage their questions.

I eagerly invite your participation in our science studies. Some things you can do include:

- Keep a running list of questions your family asks about the world.
- If you visit a science museum or watch a television program about science, write up what your family learned. We'll add it to our Science Lives corner.
- If you are a scientist, we would love to have you visit our class and tell us about your work.

Each book offers ideas for wonderful science-related projects. When your child brings a book home, please look through the activities suggested at the back. Pick one-or two-and work on it with your child. Have fun!

(Tear along the line and return to the teacher)



Child's name \_\_\_\_\_ Date \_\_\_\_\_

I have read the notice about the science program, and I look forward to learning more about it from my child.

Please check one:

I would like to participate. This is how I can help:

\_\_\_\_\_

\_\_\_\_\_

Sorry, I am unable to participate.

Signed \_\_\_\_\_

Approved by: \_\_\_\_\_

# MY DISCOVERY

Name: \_\_\_\_\_

Date: \_\_\_\_\_

What I found or saw: \_\_\_\_\_

\_\_\_\_\_

When I made my discovery: \_\_\_\_\_

Where I made my discovery: \_\_\_\_\_

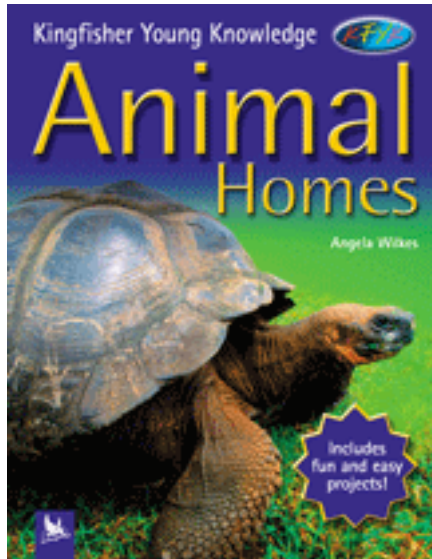
\_\_\_\_\_

What I know about my discovery: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## A Teacher's Guide



### Animal Homes

by Angela Wilkes

- Discussion
- Vocabulary
- Art
- Language Arts/Writing and Speaking
- Activity Sheet

### Discussion

---

Begin your study of *Animal Homes* by Angela Wilkes with a discussion with the children on what they know about homes. Questions can include the following:

- What different kinds of homes do people live in?
- What are some animal homes?
- Why do animals build homes?
- Where do they build their homes?
- How are animal homes different from one another?

As the children give their answers, start creating a **KWL** chart to keep track of the many things they know and would like to know about animal homes. As the class reads the book, refer back to the **KWL** chart and add new things they learn.

Sample KWL Chart:

<i>Animal Homes</i>		
What we <b>k</b> now about animal homes	What we <b>w</b> ould like to learn about animal homes	What we <b>l</b> earned about animal homes
Some animals live in trees.	How do birds build their nests?	The cape weaverbird builds a nest of grass and reeds.

## Standards:

### Language Arts:

- Generates questions about topics of interest.
- Uses a variety of sources to gather information.
- Makes contributions in class and group discussions.
- Relates new information to prior knowledge and experience.

## Vocabulary

---

Highlighted vocabulary words can be found at the bottom of the pages in the book. Below are additional words from the text that you should focus on:

shelter (page 6)  
burrows (page 7)  
freshwater (page 8)  
silk (page 15)  
saliva (page 18)

swarm (page 19)  
nectar (page 31)  
lodges (page 34)  
gnaw (page 35)  
attics (page 38)

Our suggestions on how to use these words effectively are found on page 2 of the guide.

## Standards:

### Language Arts/Readings:

- Uses word reference materials to determine the meaning and pronunciation of unknown words.
- Uses a variety of context clues to decode unknown words.

## Art

---

Many animals build their homes with things they find lying around. They might use twigs, feathers, candy wrappers, dried grass, and leaves.

Have your students create a multimedia picture of their house. They can start by drawing a picture of a house or you can supply them with a prepared picture to use as a template. The children can then finish the picture using yarn for the outline of the house, twigs and leaf pieces for trees, and grass clippings for the lawn. They might even put in some litter that blew onto the lawn, using pieces of a candy wrapper.

Materials you'll need are

- yarn
- small twigs
- grass clippings
- candy wrappers

- leaves cut in small pieces
- white glue

## Standards:

### Visual Arts:

- Uses visual structures and functions of art to communicate ideas.
- Knows the different kinds of media, techniques, and processes that are used to create works of art.

## Language Arts/Writing and Speaking

---

### Who Am I and Where Do I Live?

Give each child an index card with the name of an animal on it. (The children should keep their animal a secret.) The children can research their animal's home in *Animal Homes* and other sources available in the classroom. Have each student write a description of the animal's home based on his or her research, without mentioning the name of the animal. Have the children read their descriptions aloud, and the class can play a guessing game: Who Am I and Where Do I Live?

For example: I live with a lot of my friends. We build a home made up of tiny cells. The outside of my home is made of layers of paper, which I make by chewing wood and mixing it with my saliva. Who am I and where do I live?

## Standards:

### Language Arts/Writing:

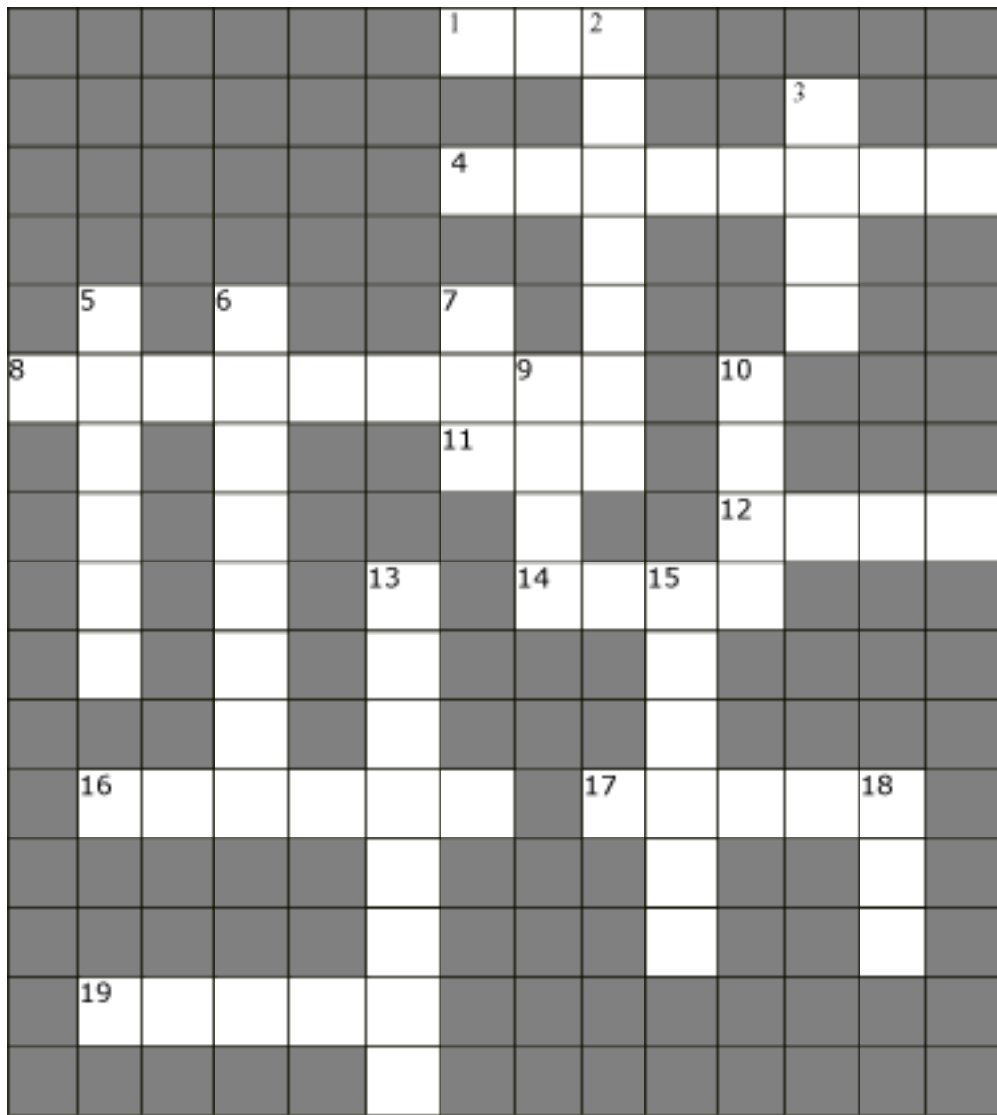
- Uses a variety of sources to gather information.
- Summarizes information in the child's own words.

### Language Arts/Communication Skills:

- Organizes ideas for oral presentations.
- Makes basic oral presentations to class.

## Activity Sheet

Read the clues at the bottom and fill in the squares to complete the puzzle. All of the answers to the crossword puzzle can be found by reading *Animal Homes* by Angela Wilkes.



### Across

1. Roosts in trees, caves, and barns
4. Takes its house with it wherever it goes
8. A place where you can live
11. Makes a honeycombed home
12. Small amphibian resembling a salamander
14. Relative of a frog
16. Dig deep underground
17. Builds its home on platforms or chimneys
19. Home built in the middle of a pond

### Down

3. Honeycombed home
5. Spins a home of silk
6. Hunts other animals for food
7. Home used to catch insects
9. Safe place to hatch eggs
10. Place where watery creatures live
13. Huge groups of animals
15. Polar bears live in the\_\_\_\_\_.
18. Baby fox

## Answers to Animal Homes crossword puzzle

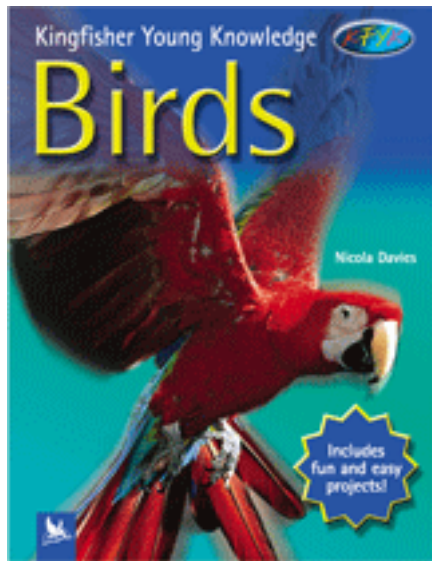


### Standards:

#### Language Arts/Readings:

- Uses word reference materials to determine the meaning and pronunciation of unknown words.
- Uses a variety of context clues to decode unknown words.
- Understands the main idea and supporting details of simple expository information.

# A Teacher's Guide



## Birds

by Nicola Davies

- Discussion
- Vocabulary
- Science and Language Arts/Listening Skills
- Language Arts and Art
- Activity Sheet

## Discussion

---

Begin your study of *Birds* by Nicola Davies with a discussion of what the children know about birds. Questions can include the following:

- What birds do you see near the school?
- What do baby birds hatch from?
- Where do birds build their homes?
- How are birds different from other animals?

As the children give their answers, start creating a **KWL** chart to keep track of the many things they know and would like to know about birds. As the class reads the book, refer back to the **KWL** chart and add new things they learn.

Sample KWL Chart:

<i>Birds</i>		
What we <b>k</b> now about animal homes	What we <b>w</b> ould like to learn about animal homes	What we <b>l</b> earned about animal homes
Birds hatch from eggs.	How are birds different from other animals?	Birds have feathers and hollow bones.

## Standards:

### Language Arts:

- Generates questions about topics of interest.
- Uses a variety of sources to gather information.
- Makes contributions in class and group discussions.
- Relates new information to prior knowledge and experience.

## Vocabulary

---

Highlighted vocabulary words can be found at the bottom of the pages in the book. Here are additional words from the text that you should focus on:

scaly (page 6)

talons (page 8)

mate (page 24)

bobbing (page 25)

yolk (page 28)

sac (page 28)

fluffy down (page 30)

owlet (page 30)

hatchlings (page 30)

signal (page 40)

These words are not mentioned in the text, but you might find them useful:

ornithology  
ornithologist  
raptors  
species

Our suggestions on how to use these words effectively are found on page 2 of the guide.

## Standards:

### Language Arts/Reading:

- Uses word reference materials to determine the meaning and pronunciation of unknown words.
- Uses a variety of context clues to decode unknown words.

## Science and Language Arts/Listening Skills

---

Birds communicate by making chirping sounds. These sounds are particular to their species. They make different sounds based on the situation they are in. For example, there is a sound to call another during the mating season, and there is a sound to warn others of danger. Have the children practice their listening skills and learn how birds can communicate with each other.

## Materials:

- 16 16-ounce plastic soda bottles (the bottles must be the same size)
- Water
- Construction paper

## Procedure:

- Separate the bottles into eight pairs.
- Fill both bottles in the first pair with the same amount of water.
- Do the same for the other pairs.
- Make sure that the water level in each pair is different from that in the other pairs.
- Show the children how to blow over the top of the bottles to make a sound.
- Have them practice listening to the sounds made from each pair of bottles.
- Cover the bottles with construction paper so that the levels of water are hidden.
- Scramble the bottles.

Have the children blow over the bottles and try to match up the original pairs by listening to the sounds made.

## Standards:

### Science:

- Understands the nature of scientific inquiry.
- Knows that learning can come from careful observation and simple experiments.
- Knows that sound is produced by vibrating objects.

### Language Arts/Listening:

- Listens and responds to a variety of media.

## Language Arts and Art

---

Have the students in your class become bird watchers. Assign each child a bird mentioned in the text. Have each child describe in detail his or her bird (color, size, beak shape, foot shape, etc.). Each child should decide which characteristic of his or her bird is most outstanding. For example, for the blue-footed booby, it could be its webbed blue feet, or for

the toucan it could be its long bright bill. Visit the library or use the Internet to find out more about each bird (habitat, food, etc.).

Enter the information on the worksheet on the following page, along with a drawing of the bird. Draw an arrow to the most important characteristic. Gather the worksheets and bind them into a Class Bird Identification Book.

Birds in your town:

Encourage the children and their parents to make the bird feeders on pages 44 and 45. When a bird comes to the feeder, the child should quietly observe it and write down a description of it on a Bird Identification Sheet. Add the birds seen in your town to the class's Bird Identification Book.

### **Standards:**

Visual Arts:

- Uses visual structures and functions of art to communicate ideas.
- Knows the different kinds of media, techniques, and processes that are used to create works of art.

Language Arts/Writing:

- Uses a variety of sources to gather information.
- Summarizes information in the student's own words.

# Activity Sheet

---

## Bird Identification Worksheet

Draw a picture of your bird.

Name of Bird: _____

### Characteristics:

Size: \_\_\_\_\_

Color: \_\_\_\_\_

Shape of beak: \_\_\_\_\_

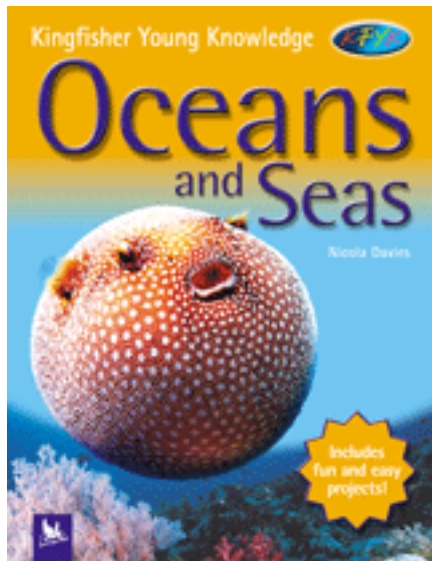
Shape of foot: \_\_\_\_\_

Habitat: \_\_\_\_\_

Food (diet): \_\_\_\_\_

Bird observed by: \_\_\_\_\_

## A Teacher's Guide



### Oceans and Seas

by Nicola Davies

- Discussion
- Vocabulary
- Science/Art Project
- Letter Writing
- Activity Sheet

### Discussion

Begin your study of *Oceans and Seas* by Nicola Davies with a discussion with the children on what they know about the ocean. Questions can include the following:

- Where are the oceans?
- Why is the earth sometimes called a big blue marble?
- What animals live in the ocean? (compile a list)
- How deep is the ocean?

As the children give their answers, create a **KWL** chart to keep track of the many things they know and would like to know about the oceans and seas. As the class reads the book, refer back to the **KWL** chart and add new things they learn.

Sample KWL Chart:

<i>Oceans and Seas</i>		
What we <b>k</b> now about oceans	What we <b>w</b> ould like to learn about oceans	What we <b>l</b> earned about oceans
The ocean is salty.	Why is ocean water salty?	Rivers wash salt from the land into the oceans and seas.

## Standards:

### Language Arts:

- Generates questions about topics of interest.
- Uses a variety of sources to gather information.
- Makes contributions in class and group discussions.
- Relates new information to prior knowledge and experience.

## Vocabulary

---

Highlighted vocabulary words can be found along the bottom of many of the pages in the book. Here are additional words from the text that you should focus on:

plankton (page 7)  
landscape (page 10)  
tides (page 13)  
El Niño (page 15)  
coral reef (page 26)

droughts (page 15)  
food chain (page 24)  
slaughter (page 38)  
kelp (page 24)  
camouflage (page 32)

Several terms are referred to in the book but not named directly. You should include them in your discussions:

oceanographers  
zoologists  
erosion

Our suggestions on how to use these words effectively are found on page 2 of the guide.

## Standards:

### Language Arts:

- Uses word reference materials to determine the meaning and pronunciation of unknown words.
- Uses a variety of context clues to decode unknown words.

## Science/Art Project

---

The Dead Sea, on the borders of Israel and Jordan, is so salty that mounds of salt are left on the shoreline where the water evaporates. The following activity demonstrates the effects of evaporation of saltwater.

### Painting with Saltwater

## Materials needed:

- Quart mixing container
- Table salt
- Warm water
- Food coloring
- Paint cups
- Paintbrushes
- Watercolor art paper
- Mixing spoon

## Procedure:

- Fill the quart mixing container with about 24 ounces of warm water.
- Slowly add the table salt to the water, constantly stirring to enable the salt to dissolve.
- When no more salt will dissolve into the water, set the mixture aside and let it cool.
- Carefully decant the saltwater solution into the paint cups, making sure that any salt crystals at the bottom of the mixing container do not get into the cups.
- Add a few drops of food coloring to each paint cup, and the children are ready to paint.
- Have them paint ocean and seascape pictures with their saltwater paints.
- Ask the children to hypothesize about what will happen to their paintings when the paint dries.
- When the pictures are dry, have the children examine them carefully and record what they observe.
- Based on what they observe and what they know, they should draw a conclusion about what happened.
- Have the children write paragraphs about the experience. The paragraph should reflect what they did, what they observed, and the reasons for the results.

## Standards:

### Science:

- Understands the nature of scientific inquiry.
- Knows that learning can come from careful observations and simple experiments.
- Keeps a notebook that describes observations made.
- Knows that matter has different states.
- Knows that most of the earth is covered with water.

### Visual Arts:

- Uses visual structures and functions of art to communicate ideas.
- Knows the different kinds of media, techniques, and processes that are used to create works of art.

## Letter Writing

---

After reading *Oceans and Seas*, your students will be aware that the ocean and many of the animals that live in it are threatened by careless treatment by people. For a class project, have the class draft a letter imploring their elected officials to do more to protect the ocean environment. Brainstorm with the students about what they would include in the letter.

Sample start:

*Dear \_\_\_\_\_,*

*Our class has been learning about the oceans and the seas as part of our science study. We learned that oil spills and sewage are killing marine life . . .*

Each child should sign his or her name to the letter. Copies can be sent to their members of the House of Representatives and the U.S. Senate, and to local newspapers and radio and TV reporters.

### Standards:

#### Language Arts/Writing:

- Uses the general skills and strategies of the writing process.

#### Social Studies:

- Understands that he or she is a member of the community.
- Contributes to the well-being of the community.

## Activity Sheet

---

### Sea Life and the Ocean Scramble:

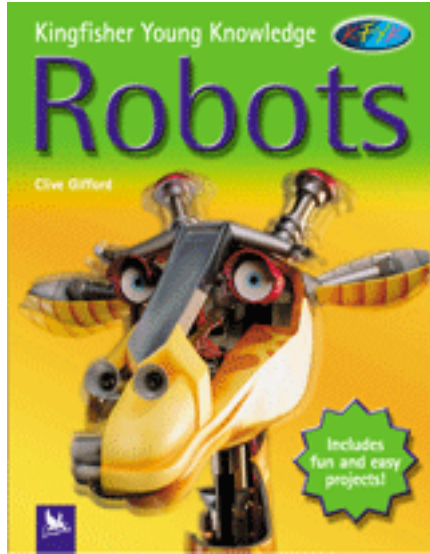
Mammals, fish, birds, reptiles, invertebrates, and plants are all a part of oceans and seas. Have fun with your class identifying some of them. On the left side is a brief description of a sea life. On the right side is the name of the sea life scrambled up. Have the children unscramble the letters to reveal what animal or plant it is. (We've provided page references to help them along.)

Large plant-eating ocean mammal that is also called a sea cow (page 21)	gun dog
Fish that is called a living fossil because it was thought to be extinct (page 16)	catch one l
A sea bird that travels over 15,000 miles each year (page 23)	can critter
A fish that can camouflage itself as a piece of seaweed (page 18)	read a song
The main food of the humpback whale (page 31)	kill r
Feeds on sea urchins and likes to rest on a bed of kelp (page 29)	tea store
Mammals known to be a danger to all the animals in the sea (page 38)	sun ham
Five million of them can be found in one nesting area (page 32)	gun snipe
Big ocean predator (page 18)	lush baker
It's at the bottom of a long food chain (page 25)	top lank n

Sea Life and the Ocean Scramble answers:

dugong	sea otter
coelacanth	humans
Arctic tern	penguins
sea dragon	blue shark
krill	plankton

# A Teacher's Guide



## Robots

by Clive Gifford

- Discussion
- Vocabulary
- Language Arts/Writing
- Theatre Arts

### Discussion

Begin your study of *Robots* by Clive Gifford with a discussion with the children on what they know about robots. Questions can include the following:

- What is a robot?
- What does a robot look like?
- How does a robot work?
- What are some things a robot can do?
- Who is smarter, people or robots?

As the children give their answers, start creating a **KWL** chart to keep track of the many things they know and would like to know about robots. As the class reads the book, refer back to the **KWL** chart and add new things they learn.

Sample KWL Chart:

<i>Robots</i>		
What we <b>k</b> now about robots	What we <b>w</b> ould like to learn about robots	What we <b>l</b> earned about robots
Robots are machines that work on their own.	Can a robot think?	<i>Deep Junior</i> can think through three million chess moves each second.

## Standards:

### Language Arts:

- Generates questions about topics of interest.
- Uses a variety of sources to gather information.
- Makes contributions in class and group discussions.
- Relates new information to prior knowledge and experience.

## Vocabulary

---

Highlighted vocabulary words can be found at the bottom of the pages in the book. Here are additional words from the text that you should focus on:

devise (page 6)

controller (page 8)

interact (page 9)

pressure (page 10)

mobile (page 16)

trekked (page 23)

images (page 27)

bomb disposal (page 32)

hover (page 36)

surgeons (page 39)

Our suggestions on how to use these words effectively are found on page 2 of the guide.

## Standards:

### Language Arts/Readings:

- Uses word reference materials to determine the meaning and pronunciation of unknown words.
- Uses a variety of context clues to decode unknown words.

## Language Arts/Writing

---

As a prewriting exercise, brainstorm with the children about the qualities they would want for their own personal robot. Using the list, have each student write a selection about his or her personal robot. Each student should decide whether the robot is a friend or a servant. The stories should include the robot's name, how it was acquired, what it looks like, and what it can do.

Divide the class into writing partners. Have the students evaluate one another's work and make suggestions for revision. When the stories are revised, the students should present their stories to the whole class.

For a second activity, have the children rewrite their stories from the point of view of the robot.

## Standards:

### Language Arts/Writing:

- Uses prewriting strategies to plan written work.

- Evaluates own and others' writing.
- Writes in a variety of forms or genres.
- Understands elements of character development.

## Theatre Arts

---

If each of the machines in the book *Robots* could talk, it could make an interesting story. With your class, create a theater of robots. Assign a different robot mentioned in the book to each child. Based on what he or she has learned about the robot, have each write a short monologue or dialogue for it, telling who it is and what it does. The children can imagine adventures each robot has had — for example, a daring rescue or a walk on Mars. The children can make robot costumes or draw large posters of their robots which they can wear as costumes. They can perform their scripts in a robot theater.

### Standards:

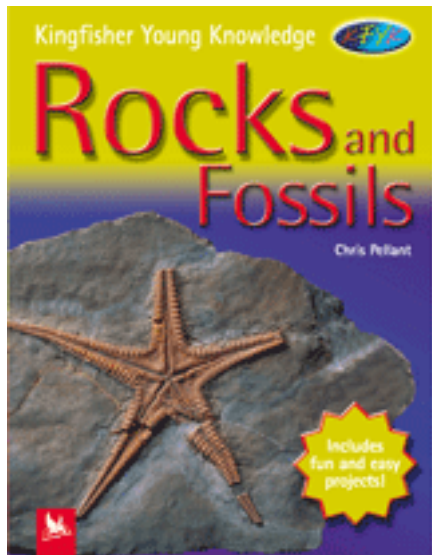
#### Theatre Arts:

- Writes dialogue.
- Knows characters in dramatizations.
- Uses variations of locomotor and nonlocomotor movement and vocal pitch.
- Understands the visual, aural, oral, and kinetic elements of dramatic presentations.

#### Cooperative Learning:

- Works with others to achieve a common goal.

## A Teacher's Guide



# Rocks and Fossils

by Chris Pellant

- Discussion
- Vocabulary
- Science
- Language Arts/Writing
- Activity Sheet

## Discussion

Begin your study of *Rocks and Fossils* by Chris Pellant with a discussion on what the children know about rocks and fossils. Questions can include the following:

- Where do rocks come from?
- What does a rock look like?
- Are all rocks the same?
- What are rocks used for?
- Can you find things in the classroom that are made from rocks?

As the children give their answers, start creating a **KWL** chart to keep track of the many things they know and would like to know about robots. As the class reads the book, refer back to the **KWL** chart and add new things they learn.

Sample KWL Chart:

<i>Rocks and Fossils</i>		
What we <b>k</b> now about rocks and fossils	What we <b>w</b> ould like to learn about rocks and fossils	What we <b>l</b> earned about rocks and fossils
Rocks are very hard.	How is a rock made?	Igneous rocks are formed in volcanoes.

## Standards:

Language Arts:

- Generates questions about topics of interest.

- Uses a variety of sources to gather information.
- Makes contributions in class and group discussions.
- Relates new information to prior knowledge and experience.

## Vocabulary

---

Highlighted vocabulary words can be found at the bottom of the pages in the book. Here are additional words from the text that you should focus on:

granite (page 7)	limestone (page 14)
minerals (page 7)	metamorphic rocks (page 16)
igneous rocks (page 8)	meteorite (page 24)
basalt (page 11)	fossilization (page 30)
sedimentary rocks (page 12)	geologist (page 32)

Our suggestions on how to use these words effectively are found on page 2 of the guide.

### Standards:

Language Arts/Readings:

- Uses word reference materials to determine the meaning and pronunciation of unknown words.
- Uses a variety of context clues to decode unknown words.

## Science

---

A geologist is a scientist who studies rocks by making careful observations. Have your students be junior geologists.

### Materials needed:

- Collection of different rocks
- Large bag
- Magnifying glass
- Rock worksheet (see the reproducible at the end of the guide)

### Procedure:

- Place the rocks in the bag.
- Have each child reach into the bag and select a rock.
- The children should observe their rock's shape, size, color, hardness or softness, texture (smooth, shiny, rough, sharp), and smell.
- They should also examine their rock's crystals with the magnifying glass and note the crystals' size, color, and shape.

- The observations should be entered on the worksheet.
- Collect the rocks and place them back in the bag.
- Pour the rocks onto the table and have the children find their rocks based on their observations.

## Standards:

### Science:

- Understands the nature of scientific inquiry.
- Knows that learning can come from careful observations and simple experiments.
- Keeps a written record of all observations.
- Knows the properties of rocks.
- Knows that rocks come in many different shapes and sizes.

## Language Arts/Writing

---

After reading *Rocks and Fossils*, ask the class to imagine that a large oval rock that resembles the dinosaur eggs in the picture on page 35 was found in the school's playground. Questions for discussion may include the following:

- Could it be a real fossilized dinosaur egg?
- How did it get in the school playground?
- Should they keep it in the classroom or give it to a museum?
- What would happen if a dinosaur hatched out of the egg?
- What kind of dinosaur would it be?
- How would they take care of it?
- What name would they give it?
- Would the dinosaur be dangerous or friendly?
- What would happen when the dinosaur grows up?

After the discussion, have the class write and illustrate stories called "The Day a Baby Dinosaur Hatched in Our Class."

## Standards:

### Language Arts/Writing:

- Uses prewriting strategies to plan written work.
- Evaluates own and others' writing.
- Writes in a variety of forms or genres
- Understands elements of character development.
- Writes and creates visual art in response to literature.

# Activity Sheet

---

[This is a reproducible]

## Rock Worksheet

Picture of my rock

### My Observations:

Shape: \_\_\_\_\_

Size: \_\_\_\_\_

Texture: \_\_\_\_\_

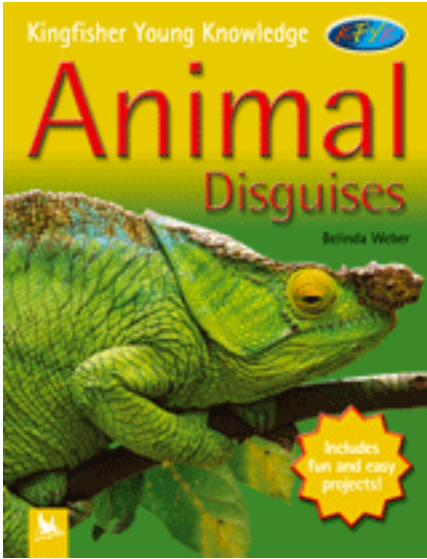
Color: \_\_\_\_\_

Smell: \_\_\_\_\_

Crystals (size and color): \_\_\_\_\_

Junior geologist: \_\_\_\_\_

# A Teacher's Guide



## Animal Disguises

by Belinda Weber

- Discussion
- Vocabulary
- Language Arts/Writing
- Art
- Activity Sheet

### Discussion

Begin your study of *Animal Disguises* by Belinda Weber with a discussion about what your students know about disguises. Questions can include:

- Name some animals that camouflage themselves.
- When do some animals disguise their appearances?
- What are some ways different animals disguise themselves?
- Can fish become camouflaged?
- Why is it important that a baby animal be camouflaged?

As the children give their answers, start creating a **KWL** chart to keep track of the many things they know and would like to know about animal disguises. As the class reads the book, refer back to the **KWL** chart and add new things they learn.

Sample KWL Chart:

<i>Animal Disguises</i>		
What we <b>k</b> now about animal disguises	What we <b>w</b> ould like to learn about animal disguises	What we <b>l</b> earned about animal disguises
Some animals can change their appearance when the weather changes.	Why does the arctic fox get a white coat in the winter?	The arctic fox gets a white coat in the winter so it can sneak up on its prey and not be seen against a snowy landscape.

## Standards:

### Language Arts:

- Generates questions about topics of interest
- Uses a variety of sources to gather information
- Makes contributions in class and group discussions
- Relates new information to prior knowledge and experience

## Vocabulary

---

Highlighted vocabulary words are found at the bottom of the pages in the book. Additional words from the text that you should focus on are:

camouflage (page 6)

blend (page 8)

rain forest (page 11)

riverbed (page 15)

algae (page 21)

countershading (page 22)

squabble (page 30)

tufts (page 30)

menu (page 36)

anglers (page 37)

## Standards:

### Language Arts/Reading:

- Uses word reference materials to determine the meaning and pronunciation of unknown words
- Uses a variety of context clues to decode unknown words

## Language Arts/Writing

---

Have the children pick a camouflaged animal they would like to write about. As a prewriting activity, have them answer these questions: What animal are you? What environment do you live in? Is it dry? It is cold? How do you camouflage yourself? Are you a predator or prey? How does being camouflaged help you?

Ask them to write a first person narrative about what they are thinking while camouflaged as a predator hiding to catch its food or as the prey trying to hide from the predator. They should leave the type of animal out of their stories, so that when they present their stories to the class, the others can guess which animal they are. Be sure the students provide clues to which animals they are. Clues should include predator or prey, color, how they camouflage themselves, environment, and so forth.

## Standards:

### Language Arts/Writing:

- Uses a variety of sources to gather information
- Summarizes information in own words

## Language Arts/Communication Skills:

- Organizes ideas for oral presentations
- Makes basic oral presentations to class

## Art

---

### Materials that might be needed:

shoe box or small carton	twigs
paintable clay	tempra
cotton	oak tag
grass clippings	scissors
white glue	sand
soil	

Using the stories that your students wrote in the activity above, ask them to make dioramas about their animals. They should camouflage them as they would be in their environments. The children could draw and mount the animals on sticks or model them using paintable clay. The list above suggests some materials that could be useful. They should decide what other materials they can use to make their dioramas more realistic. Display the projects with the stories the children wrote in your science center.

### Standards:

#### Visual Arts:

- Uses visual structures and functions of art to communicate ideas
- Knows the different kinds of media, technique, and processes that are used to create works of art

## Activity Sheet

---

### Animal Disguises Match

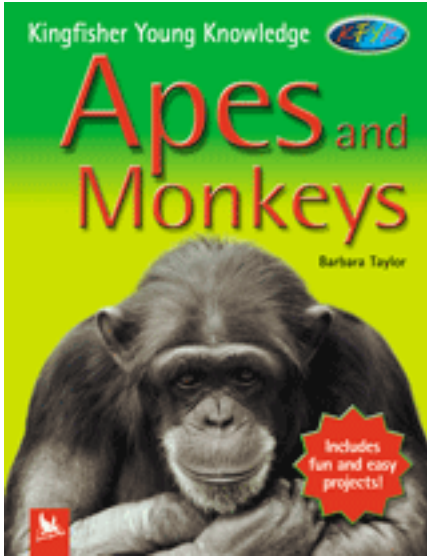
Each animal has a particular way that it camouflages itself to hide from other animals. Match the animal to its camouflaged disguise.

- |                       |                                       |
|-----------------------|---------------------------------------|
| 1. Leaf-tailed gecko  | a. coat blends with shadows on grass  |
| 2. Crocodile          | b. false eyes                         |
| 3. Giraffe            | c. coat turns white in winter         |
| 4. Milk snake         | d. can be mistaken for a floating log |
| 5. Shingleback lizard | e. looks like the forest floor        |
| 6. Stargazer fish     | f. coat looks like patches of shade   |
| 7. Tiger              | g. its tail looks like its head       |
| 8. Marsupial frog     | h. looks like dead leaves             |
| 9. Snowshoe hare      | i. buries itself in the seabed        |
| 10. Butterfly fish    | j. looks like the coral snake         |

*Answers to "Animal Disguises Match":*

- |                              |  |
|------------------------------|--|
| <i>1. Leaf-tailed gecko</i>  | <i>h. looks like dead leaves</i>             |
| <i>2. Crocodile</i>          | <i>d. can be mistaken for a floating log</i> |
| <i>3. Giraffe</i>            | <i>f. coat looks like patches of shade</i>   |
| <i>4. Milk snake</i>         | <i>j. looks like the coral snake</i>         |
| <i>5. Shingleback lizard</i> | <i>g. its tail looks like its head</i>       |
| <i>6. Stargazer fish</i>     | <i>i. buries itself in the seabed</i>        |
| <i>7. Tiger</i>              | <i>a. coat blends with shadows on grass</i>  |
| <i>8. Marsupial frog</i>     | <i>e. looks like the forest floor</i>        |
| <i>9. Snowshoe hare</i>      | <i>c. coat turns white in winter</i>         |
| <i>10. Butterfly fish</i>    | <i>b. false eyes</i>                         |

# A Teacher's Guide



## Apes and Monkeys

by Barbara Taylor

- Discussion
- Vocabulary
- Language Arts/Art
- Science
- Language Arts/Writing
- Language Arts/Communication Skills

### Discussion

---

Begin your study of *Apes and Monkeys* by Barbara Taylor with a discussion about what your students know about apes and monkeys. Questions can include:

- Have you ever visited a zoo and seen apes or monkeys? What do you remember about them?
- Where do apes and monkeys live?
- What different types of apes or monkeys do you know?
- Is a chimpanzee an ape or a monkey? How can we find out?

As the children give their answers, start creating a **KWL** chart to keep track of the many things they know and would like to know about apes and monkeys. As the class reads the book, refer back to the **KWL** chart and add new things they learn.

Sample KWL Chart:

<i>Apes and Monkeys</i>		
What we <b>k</b> now about apes and monkeys	What we <b>w</b> ould like to learn about apes and monkeys	What we <b>l</b> earned about apes and monkeys
Some apes live in trees.	How are monkeys different from apes?	Apes can make and use tools.

## Standards:

### Language Arts:

- Generates questions about topics of interest
- Uses a variety of sources to gather information
- Makes contributions in class and group discussions
- Relates new information to prior knowledge and experience

## Vocabulary

---

Highlighted vocabulary words are found at the bottom of the pages in the book. Additional words from the text that you should focus on are:

upright (page 7)  
woodland (page 8)  
graceful (page 9)  
intelligent (page 16)  
waterproof (page 16)  
position (page 18)

flexible (page 18)  
grassland (page 22)  
swamp (page 22)  
scamper (page 30)  
agile (page 33)  
breeding (page 40)

Our suggestions on how to use these words effectively are found on page 2 of the guide.

## Standards:

### Language Arts:

- Uses word reference materials to determine the meaning and pronunciation of unknown words
- Uses a variety of context clues to decode unknown words

## Language Arts/Art

---

- More fun than a barrel of monkeys
- Monkey see, monkey do
- Stop monkeying around.
- You big ape
- You made a monkey out of me.
- I go ape over you.
- You're a big baboon.

There are many familiar expressions that we use that refer to monkeys and apes. We can guess that these phrases evolved as people observed the animals' behavior and physical characteristics. For example, Barbara Taylor tells us, "Monkey babies watch the other monkeys in the troop in order to learn how to climb and leap, which food is good to eat, and how to behave." Monkeys — just like human babies — learn by imitation. That may be the basis for the saying, "Monkey see, monkey do."

Discuss some of the other expressions. Have each child select a favorite and illustrate it.

## Science

Have the class make graphic organizers about a specific ape and gather information from *Apes and Monkeys* and from other resources. As they work on their organizers, they can consult the index of the book to check details about the ape they have chosen. Be sure to remind them to use the text and the photographs to gather their information.

Sample graphic organizer:

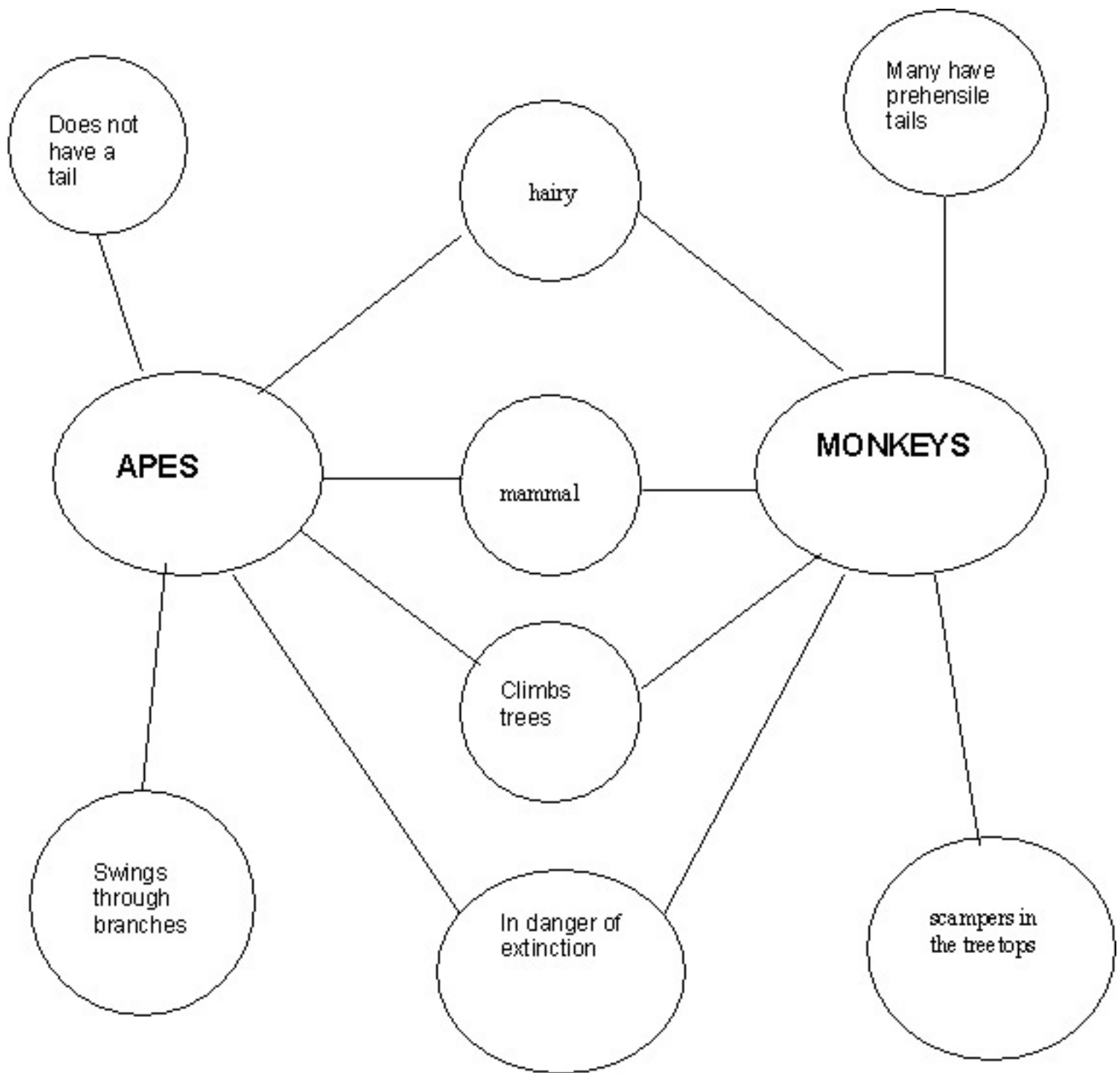
The circle map can be used to map out what the children know or learn about a specific topic.



When the circle maps are completed, have each student write a story about the ape he or she mapped.

After the children have finished work on the apes, they should make circle maps for some of the monkeys they read about. Remind them to also include what they observe in the pictures of monkeys in the book.

Your students can compare and contrast what they learn about apes and monkeys by using a double bubble map. Sample double bubble map:



**Standards:**

Language Arts:

- Generates questions about topics of interest
- Uses a variety of sources to gather information
- Makes contributions in class and group discussions
- Relates new information to prior knowledge and experience

Language Arts/Writing:

- Uses a variety of sources to gather information
- Summarizes information in own words

## Language Arts/Writing

---

Curious George is a world-famous literary monkey. Your students probably know him well. Read several Curious George books with the class. Talk about the kinds of mischief Curious George gets into. Then have the children write their own adventures of Curious George. One possible title could be, *The Day Curious George Came to Our Class*.

Have the children illustrate their stories. Bind them together in a single volume called *The Collected Stories of Curious George As Told by Class* (your class name).

### Standards:

#### Language Arts/Writing:

- Uses the general skills and strategies of the writing process
- Writes in a variety of forms or genres
- Understands elements of character development

#### Cooperative Learning:

- Works with others to produce a common goal

## Language Arts/Communication Skills

---

Apes and monkeys can communicate with each other by making sounds, making faces, and positioning their bodies to express different messages. Divide the class into groups and have each group act out a scene the way a group of apes or monkeys might. Have the "audience" guess what the messages are.

### Standards:

#### Language Arts/Listening and Speaking:

- Makes contributions in class and group discussions
- Asks and responds to questions
- Uses a variety of verbal and non-verbal communication skills

#### Language Arts/Communication Skills:

- Organizes ideas for oral presentations
- Makes basic oral presentations to class

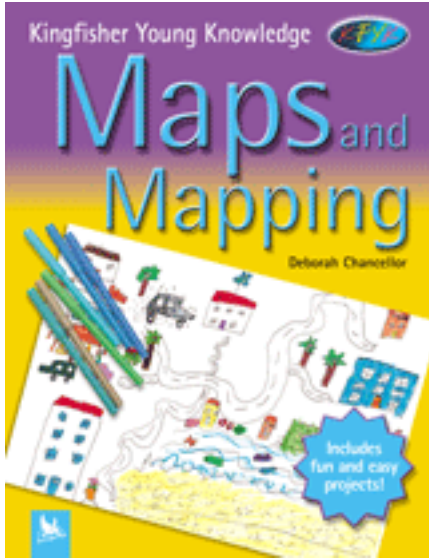
#### Theater Arts:

- Uses variations of locomotor and non-locomotor movement and vocal pitch, tempo and tone for different characters
- Understands the visual, aural, oral, and kinetic elements of dramatic presentations
- Knows how to interact in improvisations

#### Cooperative Learning:

- Works with others to produce a common goal

# A Teacher's Guide



## Maps and Mapping

by Deborah Chancellor

- Discussion
- Vocabulary
- Language Arts/Creative Writing
- Geography
- Math
- Language Arts/Literature
- Resource Books

### Discussion

---

Begin your study of *Maps and Mapping* by Deborah Chancellor with a discussion about what your students know about maps. Questions can include:

- What is a map?
- How is a map different from a globe?
- What are some things you can place on a map? (compile a list)
- When do your parents use a map?

As the children give their answers, start creating a **KWL** chart to keep track of the many things they know and would like to know about maps and mapping. As the class reads the book, refer back to the **KWL** chart and add new things they learn.

Sample KWL Chart:

<i>Birds</i>		
What we <u>k</u> now about maps	What we <u>w</u> ould like to learn about maps	What we <u>l</u> earned about maps
Maps are pictures of the ground.	Why are there horizontal and vertical lines on a map?	Latitude and longitude lines help us locate places on a map.

## Standards:

### Language Arts:

- Generates questions about topics of interest
- Uses a variety of sources to gather information
- Makes contributions in class and group discussions
- Relates new information to prior knowledge and experience

## Vocabulary

---

Highlighted vocabulary words are found at the bottom of the pages in the book. Additional words from the text that you should focus on are:

scale (page 12)

symbols (page 16)

compass (page 22)

sextant (page 23)

surveyors (page 24)

slope (page 24)

data (page 29)

seabed (page 39)

binoculars (page 40)

craters (page 41)

Our suggestions on how to use these words effectively are found on page 2 of the guide.

## Standards:

### Language Arts/Reading:

- Uses word reference materials to determine the meaning and pronunciation of unknown words
- Uses a variety of context clues to decode unknown words

## Language Arts/Creative Writing

---

In 1804, President Thomas Jefferson enlisted Meriwether Lewis and William Clark to explore, map, and survey the Louisiana Purchase, territory acquired from France in 1803. This vast wilderness is now the northwestern United States. Your students can become mapping explorers. Have them imagine they are living in the future. Space exploration is as common as traveling from New York to California. The year is 2404 and a new planet with breathable air has been discovered in a distant solar system. Your students' job is to explore, map, and survey this new planet, just like Lewis and Clark did in America 600 years earlier.

As part of their record keeping of the expedition, the children should draw pictures of what they see, create maps of the terrain, note interesting landmarks and natural formations on the map, and record and illustrate evidence of living things. Since your students will be the first humans to encounter new species of plants and animals on the planet, they should name these new forms of life. Have them write their observations in a day-by-day journal of their expedition. When they return to earth, their findings should be presented to the entire class.

## Standards:

### Language Arts/Writing:

- Writes in a variety of forms or genres
- Writes and creates visual art in response to literature

### Language Arts/Communication Skills:

- Organizes ideas for oral presentations
- Makes basic oral presentations to class

## Geography

---

Discuss with your children the idea that the United States is made up of people who have come here from many countries all around the world. Talk about what countries their families came from and why they immigrated to United States. Place a large world map in the back of the classroom. Have the children place pushpins on the map to designate the country and city they or their relatives are from. Then using the map's scale, have them calculate the distances they or their relatives had to travel to get to United States. Display the results in a chart.

Sample Chart:

<b>Our Homelands</b>			
Child's Name	City and country of origin	Distance traveled	Why they came here

## Standards:

### Geography:

- Understands the characteristics and uses of maps
- Knows the location of places and geographic features
- Understands the concept of regions
- Understands that culture and experience influence people's perceptions of place and region

## Math

---

Plan a car trip from your school to the museum nearest the school.

Materials needed:

- street map of your town for each group
- yellow highlighter
- ruler

Divide the class into groups of trip planners. Mark the location of your school and the museum on each group's map. Talk about the expression "as the crow flies." Then, using the scale of the map and a ruler, measure the direct distance from the school to the museum. Explain to the students that they are to find the shortest route to the museum. Discuss whether their routes will be shorter, longer, or the same as the crow flies. Then have each group map the route they would take to get to the museum. The students should make a list of the streets they will travel on and whether they have to make a right or a left turn to get onto the street. They should trace their final route with the yellow highlighter.

Using the map's scale and a ruler, the students will measure how far they traveled on each street and add those distances together to determine the total distance to the museum. You can use the following sample with the children:

For a scale of 1 inch equals 2 miles:

- If they travel on Main Street for 2 inches, then 2 inches times 2 miles equals 4 miles traveled ( $2 \times 2 = 4$ )
- If they then go  $\frac{1}{2}$  inch on Elm Street, then  $\frac{1}{2}$  inch times 2 miles equals 1 mile ( $\frac{1}{2} \times 2 = 1$ ).
- The total distance would be 5 miles traveled to the museum (4 miles + 1 mile).

When the children present their results, make sure they label all of their numerals with the proper units.

If some students are unable to calculate the mileage, have them record the amount of inches measured. The route with the fewest total inches is the shortest route.

### Standards:

Math:

- Makes organized lists or tables of information necessary for solving problems
- Uses discussion with teachers and other students to understand problems
- Understands the properties of and the relationships among addition, subtraction, multiplication, and division
- Solves real-world problems

Geography:

- Knows the location of school, home, neighborhood, and community

Cooperative Learning:

- Works with others to produce a common goal

## Language Arts/Literature

---

Connect *Maps and Mapping* with your literature program. Read aloud a book from your class library that involves a journey. An example would be your favorite version of *The Three Little Pigs*. Have your students first illustrate the story, then make maps of the countryside. They should include where the pigs and the wolf live, any houses or buildings that dot the landscape, the roads that lead from house to house, and the path the wolf takes as he goes from one pig's house to another.

### Standards:

Language Arts/Writing:

- Uses the general skills and strategies of the writing process
- Writes and creates visual art in response to literature

Visual Arts:

- Uses visual structures and functions of art to communicate ideas
- Knows the different kinds of media, techniques, and processes that are used to create works of art

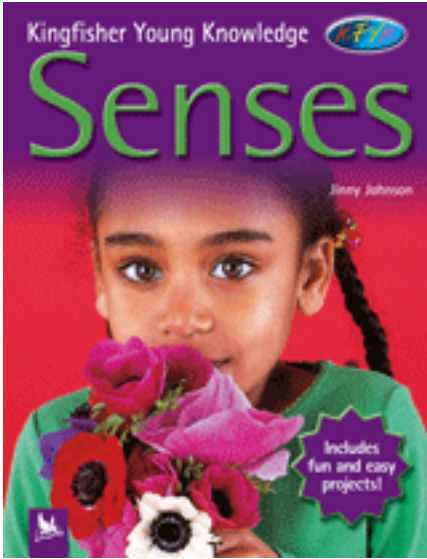
## Resource Books

---

There are a number of books to use with your class where maps are an integral part of the story. One such book is *Paddle to the Sea* by Holling C. Holling, published by Houghton Mifflin. Other books include: *Grandfather's Journey* by Allen Say, published by Houghton Mifflin, and *Train to Somewhere* by Eve Bunting, published by Clarion Books for Children.

*This guide was created by Clifford Wohl, Educational Consultant*

# A Teacher's Guide



## Senses

by Jinny Johnson

- Discussion
- Vocabulary
- Great Big Five Senses Game
- Language Arts/Writing
- Science

### Discussion

---

Begin your study of *Senses* by Jinny Johnson with a discussion about what your students know about the senses. Questions can include:

- What are some birds that you see near the school?
- What do baby birds hatch from?
- Where do birds build their homes?
- How are birds different from other animals?

As the children give their answers, start creating a **KWL** chart to keep track of the many things they know and would like to know about senses. As the class reads the book, refer back to the **KWL** chart and add new things they learn.

Sample KWL Chart:

<i>Senses</i>		
What we <u>k</u> now about senses	What we <u>w</u> ould like to learn about senses	What we <u>l</u> earned about senses
We use our senses to learn about the world around us.	How does my dog know I'm on my way home from school before I get there?	Many animals, including dogs, can smell other animals from very far away.

## Standards:

### Language Arts:

- Generates questions about topics of interest
- Uses a variety of sources to gather information
- Makes contributions in class and group discussions
- Relates new information to prior knowledge and experience

## Vocabulary

---

Highlighted vocabulary words are found at the bottom of the pages in the book. Additional words from the text that you should focus on are:

pathways (page 8)

skull (page 9)

retina (page 11)

vibrations (page 17)

scent (page 27)

irritates (page 27)

predators (page 28)

mate (page 30)

mixture (page 32)

nerve endings (page 36)

## Standards:

### Language Arts/Reading:

- Uses word reference materials to determine the meaning and pronunciation of unknown words
- Uses a variety of context clues to decode unknown words

## Great Big Five Senses Game

---

Materials needed for each team of students:

- twenty to twenty-five blank index cards
- timer

Adjectives are used to describe the sensations of the various senses. For example, *salty*, *sweet*, and *sour* describe taste; *cold*, *soft*, and *rough* are used to express the sense of touch. Brainstorm with your class various words associated with the senses. Fill in the chart below with their responses.

Sample Chart:

Adjectives for the Senses				
Sight	Hearing	Touch/Feel	Taste	Smell
bright	loud	hot	salty	sweet
dark	soft	cold	spicy	stale
red	high	rough	sour	fishy
shiny	low	smooth	bitter	cheesy

Divide the class into teams of three students each. Have the teams write each word from the chart and its associated sense onto an index card so that they will have at least a twenty-card deck. Two teams play against each other. One member of a team picks a card, but doesn't show it to his/her teammates. The other two members have to guess what is on the card by the clues that he/she gives. For example, if the card reads: "Taste — salty" the clues could be things that are salty, such as pretzels or potato chips. The team has 30 seconds to guess the right answer. The score is the number of seconds it takes for the team to get the correct answer. The team with the **lowest** score is the winner.

**Standards:**

Cooperative Learning:

- o Works with others to produce a common goal

Language Arts:

- o Understands descriptive language

**Language Arts/Writing**

Go back and review the chart on adjectives of the senses. Add nouns and verbs associated with the senses to the chart. Discuss the words with the children. Then have the children write poems using at least one word from each column.

<b>Nouns, Verbs, and Adjectives Associated with the Senses</b>				
<b>Sight</b>	<b>Hearing</b>	<b>Touch/Feel</b>	<b>Taste</b>	<b>Smell</b>
(Sample adjectives, see chart above)				
<b>Nouns</b>				
eyes	horn	ice	cookie	flower
<b>Verbs</b>				
see	listen	pet	sip	sniff
(Have your students add more nouns and verbs)				

**Standards:**

Language Arts:

- o Uses prewriting strategies to plan written work
- o Writes in a variety of forms or genres

## Science

---

The activity on pages 44 and 45 tests your students' abilities to identify food by its smell or by its taste while blindfolded. Try a third experiment to identify food by separating the sense of smell from the sense of taste.

Materials needed for each student:

- scarf
- nose clip
- five plastic cups
- milk, lemonade, apple juice, water, orange juice

Directions for the teacher:

- Divide the students into pairs. Each student will take the test while their partner records the results.
- Fill each cup with a small amount of each liquid.

Directions for students:

- Blindfold your partner with the scarf. Make sure that he/she is comfortable but cannot see.
- Carefully place the nose clip on your partner's nose. If you don't have a nose clip, pinch his/her nose so that he/she cannot smell. (Don't hurt your partner.)
- Have your partner take a sip of one of the drinks and guess what it is.
- Record the result.
- Repeat this for the four other drinks.
- Switch places and repeat the experiment with you as the tester and your partner as the recorder.
- Compare the results with the other teams and come up with a conclusion about taste and smell.

### Standards:

Science:

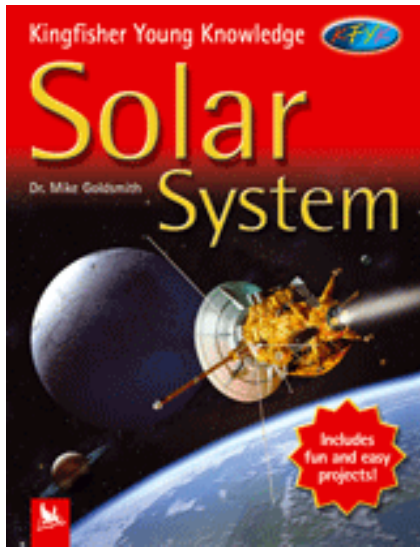
- Knows that learning can come from careful observations and simple experiments
- Keeps a notebook that describes observations made

## Record Sheet

If the drink was correctly identified mark "Y" for yes. If the drink wasn't identified correctly mark "N" for no.

<b>Taste Identification</b>		
Drink	Student #1	Student #2
Milk		
Orange juice		
Apple juice		
Lemonade		
Water		

# A Teacher's Guide



## Solar System

by Dr. Mike Goldsmith

- Discussion
- Vocabulary
- Science
- Language Arts/Writing
- Language Arts/Science/Foreign Language

### Discussion

---

Begin your study of *Solar System* by Dr. Mike Goldsmith with a discussion about what your students know about the solar system. Questions can include:

- How many planets are in our solar system?
- What is the only star in the solar system?
- What is the earth's closest neighbor in space?
- What are the two furthest planets from earth?

As the children give their answers, start creating a **KWL** chart to keep track of the many things they know and would like to know about the solar system. As the class reads the book, refer back to the **KWL** chart and add new things they learn.

Sample KWL Chart:

<i>Solar System</i>		
What we <b>k</b> now about the solar system	What we <b>w</b> ould like to learn about the solar system	What we <b>l</b> earned about the solar system
The solar system is made up of nine (ten?) planets.	Is there life on any other planet?	Scientists believe there may have been life on Mars because there used to be valleys filled with water.

### Standards:

#### Language Arts:

- Generates questions about topics of interest
- Uses a variety of sources to gather information
- Makes contributions in class and group discussions
- Relates new information to prior knowledge and experience

## Vocabulary

---

Highlighted vocabulary words are found at the bottom of the pages in the book. Additional words from the text that you should focus on are:

gas (page 11)  
sunscreen (page 11)  
erupt (page 24)  
far side of the moon (page 18)  
chemical (page 25)

ridges (page 30)  
craters (page 30)  
tapestry (page 38)  
whitish (page 39)  
drift (page 42)

### Standards:

Language Arts/Reading:

- Uses word reference materials to determine the meaning and pronunciation of unknown words
- Uses a variety of context clues to decode unknown words

## Science

---

The solar system is enormous. Unimaginably huge! But you can give your students a sense of the size of the solar system and interplanetary distances with this activity. If you have a space the size of a football field, you can make a model that is 330 feet from the Sun to Saturn. From end to end a football field is 360 feet (300 feet from goal line to goal line plus the end zones). Explain to your students that you would need up to four football fields in length to include the planets Uranus, Neptune, and Pluto in your model.

Make signs on oak tag for each of the bodies in our solar system. Each sign should have the name printed clearly and a scaled drawing. Use chart 1, which shows scaled diameters, to draw the sun and the planets. The units are in inches and millimeters. For Mercury, and Mars, use a dot the size of a period. For Venus and the Earth, double the size of the dot. For the Sun, Jupiter, and Saturn, we've included the scaled size in millimeters. (It will be easier to use.)

Divide the class into seven groups; each group to be one of the planetary bodies in the model. Using chart 2, place the group with the Sun's picture on the goal line. Then send the other groups out. They can use yardsticks or tape measures to find where they should stand. If these things are not available, we've added the number of "giant" steps they can use to pace off the distances. The Saturn group should be standing at the end of the end zone. When everyone is in place, they can see how far they are from each other and the size of each planet.

If you have limited space, you can make a smaller model of the entire solar system indoors in the school hallway in just 100 feet using chart 3.

Chart 1

<b>Body</b>	<b>Approximate Diameter in Miles</b>	<b>Scaled Diameter in Inches</b>
Sun	865,000	3.843 (about 97.5 mm)
Mercury	3,029	0.013 (small dot or period)
Venus	7,519	0.033 (large dot)
Earth	7,926	0.035 (large dot)
Mars	4,223	0.019 (small dot or period)
Jupiter	89,000	0.394 (10 mm or 1 cm)
Saturn	75,000	0.333 (8.45 mm)

Chart 2: 330 foot scale from the Sun to Saturn

<b>Body</b>	<b>Distance for the sun (miles)</b>	<b>Scaled Distance</b>	<b>Giant Steps</b>
Sun	0	0	0
Mercury	36,000,000	13ft 4in	4 ½
Venus	67,000,000	24ft 10in	8
Earth	93,000,000	34ft 5in	11 ½
Mars	141,000,000	52ft 5in	17 ½
Jupiter	484,000,000	178ft 11in	60
Saturn	1,783,000,000	328ft 1in	110

For the hallway model, represent the Sun and the planet with nametags and use the chart below:

Chart 3: 100 foot scale from the Sun to Pluto

<b>Body</b>	<b>Scaled Distance</b>
Sun	0
Mercury	11in
Venus	1ft 10in
Earth	2ft 6in
Mars	3ft 10in
Jupiter	13ft 2in
Saturn	24ft 2in
Uranus	48ft 7 in
Neptune	76ft 2in
Pluto	100 ft

## Standards:

### Science/Astronomy:

- Understands the spatial relationship between the Sun, the Earth, and the other planets
- Knows that the planets in space are separated from one another by vast distances
- Knows that planets look like stars

### Mathematics:

- Understands the basic properties of the concept of measurement

### Cooperative Learning:

- Contributes to the overall effort of a group

## Language Arts/Writing

---

In 1972, a team of scientists placed a plaque containing a pictorial message aboard the Pioneer 10 spacecraft. The message was meant to tell about the origin of the spacecraft in the unlikelyhood that it was found by some intelligent life form out in space millions of years in the future. What would your students have put in that message? What would they want someone from another solar system to know about them? Have your students discuss what is important to them and to their families. What do they think is important to humankind? Then ask each one to write about what they would place in the "space-time bottle." Their entries can be in paragraphs, letters, poems, photographs, or pictures. The children should share their responses with each other.

## Standards:

### Language Arts/Writing:

- Writes in a variety of forms or genres
- Uses the general skills and strategies of the writing process

### Language Arts/Listening and Speaking:

- Participates in group discussions

## Language Arts/Science/Foreign Language

---

Play planetary linguistics with your class and learn the names of the planets in a number of foreign languages. Below you'll find a chart of the names of the bodies in the solar system in English and three other languages: French, Spanish, and Italian. You will notice that some of the planet names are recognizable in any of the languages.

First, say the names aloud as a model for your students. Have them repeat what you say, then practice until they feel comfortable saying the words.

Then, hand out thirty 4x6 blank index cards to the class. Depending on the number of students you have, some children might get more than one card. Assign each student the name of a planet in a specific language. Each student should refer to the chart and copy the name on his/her card clearly. In the upper right hand corner of the card, he/she should write the name of the language.

To help them remember the name of the planet, ask them to decorate the card(s) with a pictures. Collect the cards and mix them up. Distribute all of the cards randomly back to the class. Again, how many cards each student gets depends on the size of your class. At a signal, they should arrange themselves in the correct order of the planets from the Sun to Pluto. If a child has more than one card he/she should say the planet closest to the Sun then move to the next group. When they are ready, starting from the Sun, they should each take turns saying the planetary name and the language it is in. You can repeat this as many times as you like and see how fast the students can group themselves in the correct order.

### Name of the Planets in Many Languages

<b>English:</b>	Sun	Mercury	Venus	Earth	Mars	Jupiter	Saturn	Uranus	Neptune	Pluto
<b>French:</b>	Soleil	Mercure	Vénus	Terre	Mars	Jupiter	Saturne	Uranus	Neptune	Pluton
<b>Italian:</b>	Sole	Mercurio	Venere	Terra	Marte	Giove	Saturno	Urano	Nettuno	Plutone
<b>Spanish:</b>	Sol	Mercurio	Venere	Tierra	Marte	Júpiter	Saturno	Uranu	Neptuno	Plutón

If some children in the class speak other foreign languages, they can add those languages to the chart.

### Standards:

Foreign Language:

- Uses vocabulary for a wide range of topics

Cooperative Learning:

- Works with others to produce a common goal